SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Sum to infinity the series

$$\frac{2}{6}+\frac{2.5}{6.12}+\frac{2.5.8}{6.12.18}+....\infty$$

17. Solve the reciprocal equation

$$8x^5-6x^4-83x^3-83x^2-6x+8=0$$

18. Verify Cayley-Hamilton theorem for the matrix

$$A=\begin{pmatrix}2 & 2 & 1\\ 1 & 3 & 1\\ 1 & 2 & 2\end{pmatrix}$$

19. Find the inverse of

$$A=\begin{pmatrix}1 & 2 & -1\\ 3 & 8 & 2\\ 4 & 9 & -1\end{pmatrix}$$

20. Show that

$$128\sin^8\theta=\cos 8\theta-8\cos 6\theta+28\cos 4\theta-56\cos 2\theta+35$$

APRIL/MAY 2023

FAEL12/CAEL12 — BASIC MATHEMATICS I

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. State the Binomial theorem for a rational index.

2. Find the co-efficient of x^n in the expansion of $(4-7x)e^{3x}$.

3. Form the equation whose roots are those of $x^6-5x^3+2x^2-x+6=0$ with their signs changed.

4. What do you mean by reciprocal Equation?

5. Define Skew – Symmetric matrix.

6. State Cayley-Hamilton's theorem.

7. Given $A=\begin{bmatrix}4 & 2 & 6\\ 7 & 3 & 5\end{bmatrix}$ find A^T.